

## Level 2 Step 4.1

### Example Monitoring and Measurement of Key Characteristics Planning Worksheet

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**Key Characteristic: Energy sources, current energy use and consumption**

Energy Source/ Energy Use/ Energy Consumption	Department	How will it be monitored/ measured?	How often will it be monitored/ measured?	How will the data be analyzed?	What calibration is required?
Facility natural gas	Facility	Utility meter	Monthly	Month to month comparison for previous 3 years	Utility responsibility
Dryer natural gas		Flow meter	Continuous	Continuous monitoring by operator for change in consumption	Annual calibration by equipment manufacturer
Electricity	Facility	Utility meter	Monthly	Month to month comparison for previous 3 years	Utility responsibility

### Key Characteristic: Significant energy uses

Significant Energy Use	Department	How will it be monitored/measured?	How often will it be monitored/measured?	How will the data be analyzed?	What calibration is required?
Compressed air system	Fabrication	Power usage	Weekly	Trends in amp draw and EnPI considering impact of temperature changes	Compressor power meter - Semiannual calibration by equipment manufacturer
Boiler	Powerhouse	Fuel input	Continuous	Trends in fuel flow and EnPI	Boiler gas flow meter - Semiannual calibration by equipment manufacturer
Roof-top HVAC	Administration	Power usage	Weekly	Trends in amp draw and EnPI considering impact of temperature change	Roof top power meter - Semiannual calibration by equipment manufacturer

**Key Characteristic: Variables affecting significant energy uses**

<b>Significant Energy Use Variable</b>	<b>Department</b>	<b>How will it be monitored/measured?</b>	<b>How often will it be monitored/measured?</b>	<b>How will the data be analyzed?</b>	<b>What calibration is required?</b>
Compressed air system	Fabrication	Average ambient temp.	Daily	Monitor temperature changes for input to performance calculations	Outside temp. recorder on roof-top HVAC - Semiannual calibration by equipment manufacturer
Boiler	Powerhouse	Stack gas oxygen and temperature	Monthly	Monitor for increase in oxygen level or stack temperature	Stack gas analyzer – Annual calibration by equipment manufacturer
Roof-top HVAC	Administration	Average ambient temp.	Daily	Monitor temperature changes for input to performance calculations	Outside temp. recorder on roof-top HVAC - Semiannual calibration by equipment manufacturer

**Key Characteristic: Future energy use and consumption of the significant energy uses**

<b>Future Energy Use/Consumption</b>	<b>Department</b>	<b>How will it be monitored/measured?</b>	<b>How often will it be monitored/measured?</b>	<b>How will the data be analyzed?</b>	<b>What calibration is required?</b>
Compressor electricity consumption	Fabrication	Sales forecast from marketing department	Review of monthly report	Review for trends in market to estimate production	Comparison with other market indicators e.g. trade association estimates
Boiler natural gas consumption	Powerhouse	Almanac for forecast rainfall	Monthly	Review for rainfall trends to plan for pre-production drying process	NOAA rainfall outlook

### Key Characteristic: Energy Performance Indicators (EnPIs)

EnPI	Department	How will it be monitored/ measured?	How often will it be monitored/ measured?	How will the data be analyzed?	What calibration is required?
Compressed air system	Fabrication	Compressed air output	Weekly	Trend in EnPI	Air flow meter on compressor output – Semiannual calibration by equipment manufacturer
Boiler	Powerhouse	Feed water flow	Monthly	Trend in EnPI	Feed water flow meter - Semiannual calibration by equipment manufacturer
Roof-top HVAC	Administration	Unit cooling output	Weekly	Trend in EnPI	1-Air flow meter on roof-top discharge - Semiannual calibration by equipment manufacturer 2-Evaporator coil temp. difference - Semiannual calibration by equipment manufacturer

**Key Characteristic: Action plan completion and effectiveness in achieving objectives and targets**

<b>Action Plan/ Objectives and Targets</b>	<b>Department</b>	<b>How will it be monitored/ measured?</b>	<b>How often will it be monitored/ measured?</b>	<b>How will the data be analyzed?</b>	<b>What calibration is required?</b>
Target: Reduce compressed air use by 3% by Dec. 2012	Fabrication	Power usage	Monthly	Comparison with 201X baseline	Power meter - Semiannual calibration by equipment manufacturer
Target: Reduce facility natural gas use by 5% by Dec. 2012	Facility	Facility natural gas meter	Continuous	Comparison with 201X baseline	Utility responsibility
Target: Reduce boiler natural gas use by 10% by Dec. 2012	Powerhouse	Fuel input	Continuous	Comparison with 201X baseline	Boiler gas flow meter - Semiannual calibration by equipment manufacturer

**Key Characteristic: Prioritized energy performance improvement opportunities**

<b>Energy Improvement Opportunity</b>	<b>Department</b>	<b>How will it be monitored/measured?</b>	<b>How often will it be monitored/measured?</b>	<b>How will the data be analyzed?</b>	<b>What calibration is required?</b>
Conduct regular air leak survey	Fabrication	Ultrasonic leak detection	Weekly	Air leaks recorded for repair by maintenance	Ultrasonic leak detector – Annual calibration by equipment manufacturer
Install controls for Improved boiler air/fuel ratio	Powerhouse	Stack gas analysis	Weekly for first 6 months then monthly	Trend lines showing oxygen and stack temperature	Stack gas analyzer - Annual calibration by equipment manufacturer

**Key Characteristic: Actual vs. expected energy consumption**

<b>Actual vs. Expected Energy Consumption</b>	<b>Department</b>	<b>How will it be monitored/measured?</b>	<b>How often will it be monitored/measured?</b>	<b>How will the data be analyzed?</b>	<b>What calibration is required?</b>
Current compressor electrical consumption vs. consumption expected with implementation of air leak program	Fabrication	Power usage	Monthly	Comparison of actual usage post air leak program implementation against 201X baseline	Power meter - Semiannual calibration by equipment manufacturer
Current boiler gas consumption vs. consumption expected with installation of air/fuel ratio controls	Powerhouse	Flow meter	Continuously	Comparison of actual usage post controls installation against 201X baseline	Boiler gas flow meter - Semiannual calibration by equipment manufacturer